



Speeds & Feeds

Product Table: Miniature End Mills - Square - Long Flute - Metric

Characteristics: 5x Length of Cut, 4 Flutes

Series: 7490xx

Please note:

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased 10%-20% if coated. For ferrous materials with hardness ≤ 28 Rc, chip loads can be increased 10%-20%.

If you require additional information, Harvey Tool has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **800-645-5609** or Harveytech@harveyperformance.com.

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.

MATERIAL	SMM	Hardness: ≤ 28 Rc (≤ 271 HBn)															
		Chip Load (MMPT) by Dia			Depth of Cut		Chip Load (MMPT) by Cutter Dia						Depth of Cut				
		0.50	0.75	1.20	Radial	Axial	1.50	2.00	2.50	3.00	5.00	6.00	9.50	12.00	Radial	Axial	
ALUMINUM ALLOYS		Slotting	.0040	.0061	.0097	1 x Dia	.08 x Dia	.0106	.0141	.0176	.0211	.0352	.0422	.0669	.0845	1 x Dia	.20 x Dia
Casting (2xx, 5xx, 7xx, 8xx)	230	Roughing	.0025	.0038	.0061	.13 x Dia	5 x Dia	.0066	.0088	.0110	.0132	.0220	.0264	.0418	.0528	.25 x Dia	5 x Dia
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	305	Finishing	.0048	.0072	.0115	.05 x Dia	5 x Dia	.0125	.0167	.0209	.0250	.0417	.0501	.0793	.1001	.10 x Dia	5 x Dia
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	230	Slotting	.0036	.0055	.0087	1 x Dia	.08 x Dia	.0095	.0127	.0158	.0190	.0317	.0380	.0602	.0760	1 x Dia	.20 x Dia
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	215																
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	200	Roughing	.0023	.0034	.0055	.13 x Dia	5 x Dia	.0059	.0079	.0099	.0119	.0198	.0238	.0376	.0475	.25 x Dia	5 x Dia
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	145																
Wrought - 5%-8% Si (4xxx)	305	Finishing	.0043	.0065	.0104	.05 x Dia	5 x Dia	.0113	.0150	.0188	.0225	.0375	.0450	.0713	.0901	.10 x Dia	5 x Dia
Wrought - 8%-12% Si (4xxx)	245																
MAGNESIUM ALLOYS	460	Slotting	.0040	.0061	.0097	1 x Dia	.08 x Dia	.0106	.0141	.0176	.0211	.0352	.0422	.0669	.0845	1 x Dia	.20 x Dia
		Roughing	.0025	.0038	.0061	.13 x Dia	5 x Dia	.0066	.0088	.0110	.0132	.0220	.0264	.0418	.0528	.25 x Dia	5 x Dia
ZINC ALLOYS	245	Finishing	.0048	.0072	.0115	.05 x Dia	5 x Dia	.0125	.0167	.0209	.0250	.0417	.0501	.0793	.1001	.10 x Dia	5 x Dia
COPPER ALLOYS																	
High Coppers - 90%+ (C1xxx)	70	Slotting	.0032	.0049	.0078	1 x Dia	.08 x Dia	.0084	.0113	.0141	.0169	.0282	.0338	.0535	.0676	1 x Dia	.20 x Dia
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C86400-C89800)	150																
Phosphor Bronzes (Copper Tin alloys, C5xxx)	70																
Aluminum Bronzes (Copper Aluminum alloys, C86800-C84200)	150	Roughing	.0020	.0030	.0049	.13 x Dia	5 x Dia	.0053	.0070	.0088	.0106	.0176	.0211	.0334	.0422	.25 x Dia	5 x Dia
Silicon Bronzes (Copper Silicon alloys, C84700-C85100)	150																
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	70																
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	170	Finishing	.0038	.0058	.0092	.05 x Dia	5 x Dia	.0100	.0133	.0167	.0200	.0334	.0400	.0634	.0801	.10 x Dia	5 x Dia

MATERIAL	Hardness: 29-37 Rc (279-344 HBn)																
	SMM	Chip Load (MMPT) by Dia			Depth of Cut		Chip Load (MMPT) by Cutter Dia						Depth of Cut				
		0.50	0.75	1.20	Radial	Axial	1.50	2.00	2.50	3.00	5.00	6.00	9.50	12.00	Radial	Axial	
CARBON STEELS	180	Slotting	.0014	.0021	.0033	1 x Dia	.08 x Dia	.0036	.0048	.0060	.0073	.0121	.0145	.0230	.0290	1 x Dia	.20 x Dia
Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx		Roughing	.0008	.0012	.0019	.13 x Dia	5 x Dia	.0020	.0027	.0034	.0041	.0068	.0082	.0129	.0163	.25 x Dia	5 x Dia
		Finishing	.0015	.0022	.0036	.05 x Dia	5 x Dia	.0039	.0052	.0065	.0078	.0130	.0156	.0248	.0313	.10 x Dia	5 x Dia
1030 - 1095, 1140 - 1151, 13xx, 15xx, 20xx, 30xx, 40xx & 4xLxx, 50xx & 5xLxx, 50xx & 50Lxx, 51xx & 51Lxx, 52xx & 52Lxx, 60xx, 80xx, 90xx	60	Slotting	.0013	.0019	.0031	1 x Dia	.08 x Dia	.0033	.0044	.0055	.0066	.0111	.0133	.0210	.0265	1 x Dia	.20 x Dia
	Roughing	.0007	.0011	.0017	.13 x Dia	5 x Dia	.0019	.0025	.0031	.0037	.0062	.0075	.0118	.0149	.25 x Dia	5 x Dia	
	Finishing	.0014	.0021	.0033	.05 x Dia	5 x Dia	.0036	.0048	.0060	.0072	.0119	.0143	.0227	.0286	.10 x Dia	5 x Dia	
STAINLESS STEELS	140	Slotting	.0014	.0021	.0033	1 x Dia	.08 x Dia	.0036	.0048	.0060	.0073	.0121	.0145	.0230	.0290	1 x Dia	.20 x Dia
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe		Roughing	.0008	.0012	.0019	.13 x Dia	5 x Dia	.0020	.0027	.0034	.0041	.0068	.0082	.0129	.0163	.25 x Dia	5 x Dia
		Finishing	.0015	.0022	.0036	.05 x Dia	5 x Dia	.0039	.0052	.0065	.0078	.0130	.0156	.0248	.0313	.10 x Dia	5 x Dia
201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502	60	Slotting	.0013	.0019	.0031	1 x Dia	.08 x Dia	.0033	.0044	.0055	.0066	.0111	.0133	.0210	.0265	1 x Dia	.20 x Dia
	Roughing	.0007	.0011	.0017	.13 x Dia	5 x Dia	.0019	.0025	.0031	.0037	.0062	.0075	.0118	.0149	.25 x Dia	5 x Dia	
	Finishing	.0014	.0021	.0033	.05 x Dia	5 x Dia	.0036	.0048	.0060	.0072	.0119	.0143	.0227	.0286	.10 x Dia	5 x Dia	
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	45	Slotting	.0008	.0012	.0019	1 x Dia	.08 x Dia	.0021	.0028	.0035	.0041	.0069	.0083	.0131	.0166	1 x Dia	.20 x Dia
	Roughing	.0004	.0007	.0011	.13 x Dia	5 x Dia	.0012	.0016	.0019	.0023	.0039	.0047	.0074	.0093	.25 x Dia	5 x Dia	
	Finishing	.0009	.0013	.0021	.05 x Dia	5 x Dia	.0022	.0030	.0037	.0045	.0075	.0089	.0142	.0179	.10 x Dia	5 x Dia	
TOOL STEELS	60	Slotting	.0013	.0019	.0031	1 x Dia	.08 x Dia	.0033	.0044	.0055	.0066	.0111	.0133	.0210	.0265	1 x Dia	.20 x Dia
A, L, O, P, W series		Roughing	.0007	.0011	.0017	.13 x Dia	5 x Dia	.0019	.0025	.0031	.0037	.0062	.0075	.0118	.0149	.25 x Dia	5 x Dia
		Finishing	.0014	.0021	.0033	.05 x Dia	5 x Dia	.0036	.0048	.0060	.0072	.0119	.0143	.0227	.0286	.10 x Dia	5 x Dia
D, H, M, T, S series	45	Slotting	.0008	.0012	.0019	1 x Dia	.08 x Dia	.0021	.0028	.0035	.0041	.0069	.0083	.0131	.0166	1 x Dia	.20 x Dia
	Roughing	.0004	.0007	.0011	.13 x Dia	5 x Dia	.0012	.0016	.0019	.0023	.0039	.0047	.0074	.0093	.25 x Dia	5 x Dia	
	Finishing	.0009	.0013	.0021	.05 x Dia	5 x Dia	.0022	.0030	.0037	.0045	.0075	.0089	.0142	.0179	.10 x Dia	5 x Dia	
TITANIUM ALLOYS	45	Slotting	.0008	.0012	.0019	1 x Dia	.08 x Dia	.0021	.0028	.0035	.0041	.0069	.0083	.0131	.0166	1 x Dia	.20 x Dia
	Roughing	.0004	.0007	.0011	.13 x Dia	5 x Dia	.0012	.0016	.0019	.0023	.0039	.0047	.0074	.0093	.25 x Dia	5 x Dia	
	Finishing	.0009	.0013	.0021	.05 x Dia	5 x Dia	.0022	.0030	.0037	.0045	.0075	.0089	.0142	.0179	.10 x Dia	5 x Dia	
HIGH TEMP ALLOYS	20	Slotting	.0008	.0012	.0019	1 x Dia	.08 x Dia	.0021	.0028	.0035	.0041	.0069	.0083	.0131	.0166	1 x Dia	.20 x Dia
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy		Roughing	.0004	.0007	.0011	.13 x Dia	5 x Dia	.0012	.0016	.0019	.0023	.0039	.0047	.0074	.0093	.25 x Dia	5 x Dia
		Finishing	.0009	.0013	.0021	.05 x Dia	5 x Dia	.0022	.0030	.0037	.0045	.0075	.0089	.0142	.0179	.10 x Dia	5 x Dia

Hardness: 38-45 Rc (353-421 HBn)																
SMM	Chip Load (MMPT) by Dia			Depth of Cut		Chip Load (MMPT) by Cutter Dia								Depth of Cut		
	0.50	0.75	1.20	Radial	Axial	1.50	2.00	2.50	3.00	5.00	6.00	9.50	12.00	Radial	Axial	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	Slotting	.0006	.0010	.0015	1 x Dia	.08 x Dia	.0017	.0022	.0028	.0033	.0055	.0066	.0105	.0133	1 x Dia	.20 x Dia
	Roughing	.0004	.0005	.0009	.13 x Dia	5 x Dia	.0009	.0012	.0016	.0019	.0031	.0037	.0059	.0075	.25 x Dia	5 x Dia
	Finishing	.0007	.0010	.0017	.05 x Dia	5 x Dia	.0018	.0024	.0030	.0036	.0060	.0072	.0114	.0144	.10 x Dia	5 x Dia
25	Slotting	.0004	.0006	.0010	1 x Dia	.08 x Dia	.0010	.0014	.0017	.0021	.0035	.0041	.0066	.0083	1 x Dia	.20 x Dia
	Roughing	.0002	.0003	.0005	.13 x Dia	5 x Dia	.0006	.0008	.0010	.0012	.0019	.0023	.0037	.0047	.25 x Dia	5 x Dia
	Finishing	.0004	.0006	.0010	.05 x Dia	5 x Dia	.0011	.0015	.0019	.0023	.0038	.0045	.0071	.0090	.10 x Dia	5 x Dia
30	Slotting	.0006	.0010	.0015	1 x Dia	.08 x Dia	.0017	.0022	.0028	.0033	.0055	.0066	.0105	.0133	1 x Dia	.20 x Dia
	Roughing	.0004	.0005	.0009	.13 x Dia	5 x Dia	.0009	.0012	.0016	.0019	.0031	.0037	.0059	.0075	.25 x Dia	5 x Dia
	Finishing	.0007	.0010	.0017	.05 x Dia	5 x Dia	.0018	.0024	.0030	.0036	.0060	.0072	.0114	.0144	.10 x Dia	5 x Dia
25	Slotting	.0004	.0006	.0010	1 x Dia	.08 x Dia	.0010	.0014	.0017	.0021	.0035	.0041	.0066	.0083	1 x Dia	.20 x Dia
	Roughing	.0002	.0003	.0005	.13 x Dia	5 x Dia	.0006	.0008	.0010	.0012	.0019	.0023	.0037	.0047	.25 x Dia	5 x Dia
	Finishing	.0004	.0006	.0010	.05 x Dia	5 x Dia	.0011	.0015	.0019	.0023	.0038	.0045	.0071	.0090	.10 x Dia	5 x Dia
22	Slotting	.0004	.0006	.0010	1 x Dia	.08 x Dia	.0010	.0014	.0017	.0021	.0035	.0041	.0066	.0083	1 x Dia	.20 x Dia
	Roughing	.0002	.0003	.0005	.13 x Dia	5 x Dia	.0006	.0008	.0010	.0012	.0019	.0023	.0037	.0047	.25 x Dia	5 x Dia
	Finishing	.0004	.0006	.0010	.05 x Dia	5 x Dia	.0011	.0015	.0019	.0023	.0038	.0045	.0071	.0090	.10 x Dia	5 x Dia
15	Slotting	.0004	.0006	.0010	1 x Dia	.08 x Dia	.0010	.0014	.0017	.0021	.0035	.0041	.0066	.0083	1 x Dia	.20 x Dia
	Roughing	.0002	.0003	.0005	.13 x Dia	5 x Dia	.0006	.0008	.0010	.0012	.0019	.0023	.0037	.0047	.25 x Dia	5 x Dia
	Finishing	.0004	.0006	.0010	.05 x Dia	5 x Dia	.0011	.0015	.0019	.0023	.0038	.0045	.0071	.0090	.10 x Dia	5 x Dia